Draft Deliberative
Do not release

Ex. 5 - Deliberative

- MOA states: "If the Services or EPA are concerned that an NPDES permit is likely to have a more than minor detrimental effect on a Federally-listed species or critical habitat, the Service or EPA will contact the appropriate State or Tribal agency (preferably within 10 days of receipt of a notice of a draft State or Tribal permit) to discuss identified concerns. . . If unable to resolve identified issue(s) with the State or Tribe, the Services will contact the appropriate EPA Regional Branch not later than five working days prior to the close of the public comment period on the State or Tribe's draft NPDES permit. . . . If contacted by the Services, EPA will coordinate with the Services and the State or Tribe to ensure that the permit will comply with all applicable CWA requirements, including State or Tribal water quality standards . . . and will discuss appropriate measures protective of federally-listed species and critical habitat." Pg. 11216.

Ex. 5 - Deliberative/Attorney Client

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Ex. 5 - Deliberative

- The MOA states that EPA will "use the full extent of its CWA authority to object to a State or Tribal permit where EPA finds (taking into account all available information, including any analysis conducted by the Services) that a state or Tribal permit is likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat."

Ex. 5 - Deliberative/Attorney Client

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August 18, 2011

VIA COURIER
VIA E-MAIL

EPA Docket Center
US Environmental Protection Agency
EPA Docket Center,
EPA West, Room 3334,
1301 Constitution Ave., NW.,
Washington, DC 20460

Re: Docket ID No. EPA–HQ–OW–2008–0667

Dear Clerk,

As counsel to Entergy Corporation, it subsidiaries and affiliates (collectively, "Entergy"), enclosed please find Entergy's comments on the United States Environmental Protection Agency's proposed rule, entitled *National Pollutant Discharge Elimination System—Cooling Water Intake Structures at Existing Facilities and Phase I Facilities*, 76 Fed. Reg. 22174 (Apr. 20, 2011) (Docket ID No. EPA-HQ-OW-2008-0667). The e-mail version includes only comments without attachments. A complete copy of comments and attachments is submitted by hand delivery, in accordance with Confidential Business Information ("CBI") requirements.

Entergy appreciates the opportunity to provide comments on this rulemaking. Should you have any questions or concerns regarding the enclosed comments, attachments, or CBI assertions, please do not hesitate to contact Chuck D. Barlow, Associate General Counsel-Environmental to Entergy Services, Inc. (at 601-969-2542) or me (at 617-570-1612).

Sincerely,

Elise N. Zoli

Enclosures
cc: Chuck D. Barlow, Associate General Counsel-Environmental, Entergy Services, Inc.

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To **US Environmental Protection Agency**
EPA Docket Center (EPA/DC) Water Docket, MC 28221T
1200 Pennsylvania Ave., NW.
Washington, DC 20460

From **Elise N. Zoli**
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Chuck D. Barlow
Associate General Counsel - Environmental
Entergy Services, Inc.
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Re Comments of Entergy Corp. on proposed rule titled *National Pollutant Discharge Elimination System—Cooling Water Intake Structures at Existing Facilities and Phase I Facilities*, 76 Fed. Reg. 22174 (April 20, 2011), Docket ID No. EPA–HQ–OW–2008–0667

Date August 18, 2011

Introduction and Summary of Comments

Entergy Services, Inc. submits the following comments on behalf of Entergy Corporation, its subsidiaries and affiliates (collectively, "Entergy"). Entergy appreciates the opportunity to submit these comments in response to the United States Environmental Protection Agency's ("EPA") proposed rule, entitled *National Pollutant Discharge Elimination System—Cooling Water Intake Structures at Existing Facilities and Phase I Facilities*, 76 Fed. Reg. 22174 (Apr. 20, 2011) (Docket ID No. EPA-HQ-OW-2008-0667) (the "draft Rule" or the "Proposed Rule"). Entergy is an integrated energy company engaged primarily in electric power production and

retail distribution operations. Entergy owns and operates power plants with approximately 30,000 megawatts ("MW") of electric generating capacity in both rate-regulated and deregulated markets. Entergy delivers electricity to 2.7 million utility customers in Arkansas, Louisiana, Mississippi and Texas, has annual revenues of more than $11 billion, and retains approximately 15,000 employees. Entergy's gross generating assets include fossil-fuel and nuclear units, and Entergy is the second-largest nuclear generator in the United States.

Entergy's nuclear facilities include nuclear power electric-generating stations providing "baseload" power in Arkansas, Louisiana, Michigan, Mississippi, New York, Vermont and Massachusetts; Entergy also manages a facility located in Nebraska and owned by the Nebraska Public Power District. Through its ownership and operation of these nuclear stations, Entergy has retained leading national environmental, engineering and economic consultants, and with their assistance developed a thorough understanding of: (1) potential entrainment and impingement effects of cooling water intake structures ("CWIS") at nuclear facilities operating under the fixed terms of Nuclear Regulatory Commission ("NRC")-issued existing licenses and twenty-year license renewals (current and future operational effects); and (2) detailed assessments of CWIS technologies, such as cylindrical wedgewire screens ("WWS"), optimized Ristroph screens (and associated fish return systems), behavioral diversion systems, closed-cycle cooling, and other alternative technologies, including the feasibility, reasonable schedules for implementation, holistic environmental and socioeconomic impacts, and costs of retrofits to CWIS of the technologies discussed in the draft Rule.

Through its ownership and operation of a fossil-fueled generating fleet, Entergy has developed a similar knowledge base regarding the potential effects of and technologies available to coal, natural gas, and oil-fueled facilities operating as baseload, load following, or peaking facilities. Entergy has been actively involved in previous agency rulemaking efforts regarding CWIS. These comments are informed by these operational histories and technical analyses. *See, e.g.,* Correspondence from Elise N. Zoli, Counsel for Entergy Corp. to Proposed Rule Comment Clerk W-00-32, EPA, enclosing comments, re: EPA ICR #2060.01 (Aug. 7, 2002); Riverkeeper, Inc. v. EPA, Dockets No. 02-4005, 02-4047 (2nd Cir. Jan. 09, 2002); Letter from Elise N. Zoli, Counsel for Entergy Companies to Water Docket, EPA, enclosing comments, re: EPA Docket ID No. OW-2002-0049 (June 2, 2003); Riverkeeper, Inc. v. USEPA, 358 F.3d 174 (2nd Cir. 2004) ("Riverkeeper I"); ConocoPhillips Co. v. USEPA, Docket No. 06-60662 (5th Cir. Jul. 14, 2006); Riverkeeper, Inc. v. USEPA, 475 F.3d 83 (2nd Cir. 2007) (''Riverkeeper II''), *cert. granted* Entergy Corp. v. USEPA, 128 S. Ct. 1867, Docket No. No.07-588 (2008); Entergy Corp. v. Riverkeeper, Inc., 129 S. Ct. 1498 (2009).

Entergy shares EPA's commitment to responsible environmental stewardship, including the agency's commitment to take steps to reduce demonstrated impacts to aquatic populations clearly linked to CWIS operations at manufacturing and electric-generating facilities, where the proposed technological antidote does not produce more severe adverse environmental impacts (the holistic analysis). To that end, we appreciate EPA's acknowledgement that potential aquatic impacts are *always* site-specific. *See, e.g.,* EPA, Environmental and Economic Benefits Analysis for Proposed Section 316(b) Existing Facilities Rule (EPA 821-R-11-002, Mar. 28, 2011) at 3-15 (hereinafter "EEBA") (acknowledging uncertainty and limitations in evaluating impingement and entrainment). Site-specificity is implicated both with respect to what potential aquatic impacts trigger application of §316(b), and also with respect to the potential technologies that

may be brought to bear to address demonstrated adverse impacts. To that end, as detailed below, EPA's definitions of entrainment and impingement must account for the extensive existing datasets at certain facilities that demonstrate the absence of meaningful impacts as a preliminary matter, or for which technology forcing creates more and/or worse adverse environmental impacts. *See, e.g.,* Barnthouse et. al, *Entrainment and Impingement at IP2 and IP3: A Biological Impact Assessment* (Jan. 2008) (hereinafter "AEI Report"); *Engineering Response to United States Environmental Protection Agency CWA §308 Letter, Pilgrim Nuclear Power Station, Plymouth, Massachusetts* (June 2008) (Prepared for and submitted on behalf of Entergy Nuclear Generating Company) (hereinafter "Pilgrim Engineering Response"); Enercon Services, Inc., et al., *Response to New York State Department of Environmental Conservation Request for Information, James A. FitzPatrick Nuclear Power Plant, Lycoming New York* (Jan. 2008) (Prepared for and submitted on behalf of Entergy Nuclear James A. FitzPatrick, LLC) (hereinafter "FitzPatrick Response"); Enercon Services Inc., *Engineering Feasibility and Costs of Conversion of Indian Point Units 2 and 3 to Closed-Loop Condenser Cooling Water Configuration* (Feb. 12, 2010) (prepared for Entergy Nuclear Indian Point 2, LLC and Entergy Nuclear Indian Point 3, LLC) (hereinafter "Enercon Engineering Feasibility Report");); Enercon Services Inc., *Evaluation of Alternative Intake Technologies at Indian Point Units 2 and 3* (Feb. 12, 2010) (prepared for Entergy Nuclear Indian Point 2, LLC and Entergy Nuclear Indian Point 3, LLC) (hereinafter "Enercon Alternative Intake Technologies Report").

Further, we appreciate EPA's recognition that the implications of the draft Rule for nuclear facilities are unique, and underscore why closed-cycle cooling is likely not available for this sector as a whole or on a site-specific basis. As discussed in detail below, EPA has acknowledged that nuclear facilities operate under intense regulatory review that includes continuous environmental and nuclear safety analyses, under time-limited licenses (e.g., twenty years on renewal) that may make large-scale construction retrofit projects non-viable during the licensing period. For this reason, discussion of water use and reductions of potential aquatic impacts must not only be grounded in settled scientific fisheries management standards (focused on populations), but also account for the particular limitations of nuclear facilities, e.g., that retrofits of facilities are unlikely to be feasible and—where feasible—will encounter lengthy implementation timelines that may not be reconcilable with twenty-year license limitations, because construction cannot be accomplished in a timeframe that would allow reasonable operation of the technology in a manner that reduces entrainment and/or impingement in a meaningful manner over time. Stated otherwise, the rational or actual assessment, i.e., one that differentiates between theoretically installed technologies and the time required to actually install them, is essential to understanding whether and when technology forcing produces measurable benefits and therefore is justified.

To that end, Entergy supports certain aspects of the draft Rule as grounded in sound science, correlated to rational assessment and therefore able to produce the meaningful benefits contemplated by §316(b). For example, Entergy supports EPA's decision to reject Options 2 and 3, which would effectively mandate closed-cycle cooling for many nuclear and fossil facilities by requiring flow reductions commensurate with closed-cycle cooling. *See, e.g.,* draft Rule at 22206. EPA correctly rejects closed-cycle cooling as the basis for entrainment mortality standards, based on its (1) technical infeasibility in certain circumstances, (2) the substantial obstacles or challenges that may block its construction or operation, (3) the lengthy schedule for implementation that would undermine any meaningful environmental benefits, and (4) the

potentially severe holistic adverse environmental impacts of cooling tower construction and operation (on a retrofit basis), particularly within regions in non-attainment with particulate material ("PM") air quality standards. *See, e.g.,* draft Rule at 22207 ("The record shows that closed-cycle cooling is not practically feasible in a number of circumstances. . . [including for purposes of] energy reliability, air emissions permits, land availability and remaining useful plant life."); draft Rule at 22206 (nuclear facilities provided 15 years to complete a retrofit "because all nuclear facilities are baseload generating units and the additional flexibility in timelines would further mitigate energy reliability, and because the retrofits at these types of facilities in particular involve additional complexities and safety issues").

Briefly in order of identification above, with respect to (1), closed-cycle cooling has been determined to be technically infeasible because of certain nuclear facilities' design, e.g., condenser limitations, as an engineering and nuclear safety matter, e.g., at Entergy's Pilgrim and James A. FitzPatrick Stations. *See, e.g.,* Pilgrim Engineering Response at §8; FitzPatrick Response at §6.1.8. With respect to (2) and (4), the severe adverse impacts of cooling towers include electric system reliability, air quality and aesthetics, and create hurdles to closed-cycle cooling's construction and operation likely to block implementation at many facilities, including as a function of local zoning that prohibits such uses, Clean Air Act requirements, and blasting mandates, all as demonstrated by the analyses performed for Entergy's Indian Point stations ("Indian Point") and demonstrated by multiple statements of opposition to closed-cycle cooling. *See, e.g.,* TRC Environmental Corporation, *Cooling Tower Impact Analysis for the Entergy Indian Point Energy Center, Westchester County, New York* 5-1 to 5-2 (Sept. 1, 2009) (Prepared for Entergy Nuclear Indian Point 2, LLC and Entergy Nuclear Indian Point 3, LLC) (hereinafter "TRC Cooling Tower Analysis") (identifying impacts to air quality and aesthetics due to operation of cooling towers at Indian Point and associated construction hurdles); Enercon Engineering Feasibility Report at 25-32 (identifying blasting and excavation restrictions and hurdles). With respect to (3), even if closed-cycle cooling is determined on a site-specific basis to be technically feasible, Entergy's analysis has confirmed EPA's findings that a 15-year or greater construction schedule for cooling towers is to be expected at nuclear facilities. *See, e.g.,* Enercon Engineering Feasibility Report at 55 (estimating a minimum of 13 years for installation of cooling towers, if possible at all and subject to substantial risk likely to increase the identified timeline). In sum, the many and diverse obstacles to closed-cycle cooling at nuclear facilities are so substantial that its application on a nationwide basis is not appropriate, and its application on a site-specific basis is highly improbable. These factors may raise, in an even more variable range of scenarios, the same issues for fossil facilities.

Consistent with this information, and while we appreciate EPA's proposal to move forward with Option 1, we believe questions emerge as to how that Option is properly justified in the draft Rule, including as a matter of law. At essence, the draft Rule proposes an impingement technology suite, while leaving indeterminate (i.e., to be resolved through a best professional judgment site-specific basis) best technology available ("BTA") determinations for entrainment, without expressly acknowledging that EPA has rejected a closed-cycle cooling mandate on a nationwide basis in Options 2 and 3. What this means is that the environmental and economic analyses in support of the draft Rule for Option 1 do not reflect an entrainment technology mandate, despite the fact that the entrainment technologies, including closed-cycle cooling, represent the most significant costs, and include the most significant adverse environmental impacts, identified in the draft Rule (including to the electric system and air quality). In other

words, a cooling tower mandate remains a distinct site-by-site possibility, but that outcome is not adequately reflected in EPA's electric system, economic and environmental analyses. Absent such analyses, we are concerned that the nationwide implications of Option 1 are not correctly understood or represented in the draft Rule, consistent with rulemaking norms. To that end, the final rule should reflect that the scope of discretionary analysis of entrainment under Option 1 is grounded on a presumption against closed-cycle cooling, consistent with EPA's economic and environmental impact analysis for Options 2 and 3, or a supplemental rulemaking including the requisite analysis should be made available for public comment.

Finally, Entergy also incorporates by reference, as if set forth here, its prior comments on the prior §316(b) rule (the "2004 Phase II Rule") and the comments of the Utility Water Act Group ("UWAG"), the Edison Electric Institute ("EEI"), and the Nuclear Energy Institute ("NEI").[1] Additionally, Entergy reserves the right to seek subsequent judicial review over any issue in the record, regardless of the party from which EPA received comments addressing that issue. *See, e.g.*, Kennecott Copper Corp. v. EPA, 612 F.2d 1232, 1236-37 (10th Cir. 1979) (adjudicating issues raised by a party who did not comment on a proposed rule where EPA had notice of same issues by comments of others); ASARCO, Inc. v. EPA, 578 F.2d 319, 321, n.1 (D.C. Cir. 1979) (same).

I. EPA'S HANDLING OF THE NUCLEAR SECTOR MERITS FURTHER ATTENTION

a. EPA's nuclear facility exemption should be revised to acknowledge that closed-cycle cooling is infeasible at certain nuclear facilities and reflect the proper process for addressing nuclear safety issues

The draft Rule includes the following provision specific to nuclear facilities:

> If the owner or operator of a nuclear facility demonstrates to the Director, upon the Director's consultation with the Nuclear Regulatory Commission, that compliance with this subpart would result in a conflict with a safety requirement established by the Commission, the Director must make a site-specific determination of best technology available for minimizing adverse environmental impact that would not result in a conflict with the Commission's safety requirement.

Draft Rule at 22284 (to be codified at 40 C.F.R. §124.94(e)).

Entergy appreciates EPA's efforts to account for nuclear safety concerns in the draft Rule. This concern is real: Closed-cycle cooling has been determined to be technically infeasible because of an existing nuclear facility's design, e.g., condenser limitations, rendering the technology infeasible as an engineering and nuclear safety matter, e.g., at Entergy's Pilgrim and James A. FitzPatrick Stations. *See* Pilgrim Engineering Response at §8; FitzPatrick Response at §6.1.8. Thus, there is no doubt that this exemption must be maintained, and is likely to be employed in

[1] Entergy believes that the incorporated comments are consistent with Entergy's individually-filed comments. If a contradiction exists between the incorporated comments and Entergy's individual comments provided herein, the latter should be taken to express Entergy's position.

the future. To that end and as detailed below, EPA's proposed approach to the exemption, while appreciated, must be revised to reflect federal law, as 40 C.F.R. §125.94(e) currently is drafted in a manner that exceeds EPA's authority. Likewise, the proposed approach should be revised to clarify its application in a manner that better reflects NRC practice.

Specifically, EPA's proposed approach is not consistent with the scope of NRC's authority in the field of nuclear safety or the manner in which nuclear safety evaluations are conducted for NRC-licensed facilities, and therefore fails to accord federal law. NRC retains exclusive authority under the Atomic Energy Act ("AEA") over the regulation of nuclear health and safety issues at NRC-licensed facilities. Upon the creation of the EPA in 1970, a narrow area of AEA-based regulatory authority was transferred from NRC (then, the Atomic Energy Commission or "AEC") to the EPA. Under Reorganization Plan No. 3 of 1970, the AEA regulatory authority that was transferred from NRC to EPA was limited to:

> [t]he functions of the [AEC] under the [AEA], as amended, administered through its Division of Radiation Protection Standards, to the extent that such functions of the [AEC] consist of establishing generally applicable environmental standards for the protection of the general environment from radioactive material. As used herein, standards mean limits on radiation exposures or levels, or concentrations or quantities of radioactive material, in the general environment outside the boundaries of locations under the control of persons possessing or using radioactive material.

Presidential Documents, Title 3 – The President, Reorganization Plan No. 3 of 1970, 35 Fed. Reg. 15623, 15624 (Oct. 6, 1970).

Thus, in all other respects, including the construction and operation of NRC-licensed facilities, NRC has exclusive jurisdiction. As between NRC and any entity implementing the draft Rule, NRC occupies the field of nuclear safety, and EPA is without authority in this field. *See, e.g.*, Pacific Gas & Elec. Co. v. State Energy Res. Conservation & Dev. Comm., 461 U.S. 190, 212 (1983) (federal government "maintains complete control" over the safety and nuclear aspects of energy generation); Train v. Colorado Pub. Interest Group, Inc., 426 U.S. 1 (1976) (allocating authority over nuclear matters between EPA and NRC). At no point is EPA, a State agency, or any other governmental entity either able to lead the process, or, as a matter of law as discussed above, reach a nuclear safety determination. Moreover, and with all due respect to EPA, it lacks the requisite expertise to evaluate nuclear safety issues.

Consistent with this settled law, EPA's proposed process should account for the roles of licensees and NRC in an accurate and meaningful manner. Specifically, alterations to NRC-licensed facilities are evaluated, in the first instance, by the licensee under 10 C.F.R. §50.59. Generally, that analysis requires the licensee to determine whether a change will result in "more than a minimal increase" in the frequency of certain safety-related events or create the possibility of an accident of a different type than previously evaluated. *See, e.g.,* 10 C.F.R. §50.59(c)(2). If the evaluated change does not have these safety-related consequences, the licensee can move forward without the prior approval of NRC. If it does involve these safety-related consequences, then a license amendment must be approved by NRC before the change can be implemented. *Id.* In practical terms, licensees often will determine first that NRC would not approve the

amendment, and decline to move forward for a license amendment, e.g., as a permittee can and often will determine that an air quality permit will not be issued and decline to move forward. Just as EPA would not require a facility to obtain a permit denial from the state or EPA itself to establish that its facility cannot be permitted, likewise the EPA process should account for licensee determinations, as the New York Department of Environmental Conservation's ("NYSDEC") comparable provision in its final BTA policy does. *See* NYSDEC, CP-52/*Best Technology Available (BTA) for Cooling Water Intake Structures, Nuclear Fuel Power Plants*, pp. 6 (July 10, 2011) ("If the owner or operator of a new or existing nuclear-fueled power plant demonstrates to Department staff that compliance with the performance goals of this Policy would result in a conflict with any safety requirement established by the Nuclear Regulatory Commission (NRC), with appropriate documentation or other substantiation from the NRC, the Department will make a site-specific determination of best technology available for minimizing adverse environmental impact that would not result in a conflict with the NRC's safety requirements.")

In summation, rather than requiring a "demonstration to the Director" that compliance with the draft Rule would conflict with a safety requirement of the NRC, the exemption should acknowledge NRC's authority over nuclear safety considerations. The exemption, moreover, should be triggered by the requirement of a license amendment for the installation or operation of technology required by the draft Rule, through the process stated in 10 C.F.R. §50.59. If, pursuant to 10 C.F.R. §50.59, a proposed change to the facility that is necessary to comply with the draft Rule would require an amendment to its NRC license (i.e., implicates nuclear safety concerns), the exemption should apply. Specifically, the proposed 40 C.F.R. §124.94(e) should be revised to read as follows:

> If the owner or operator of a nuclear facility submits a written certification to the Director that, pursuant to the owner or operator's analysis under 10 C.F.R. §50.59, compliance with this subpart would implicate nuclear safety concerns and require an amendment to the facility's Nuclear Regulatory Commission ("NRC") license, the Director must make an alternative site-specific determination of best technology available for minimizing adverse environmental impact that, as evaluated by the facility under 10 C.F.R. §50.59, would not require an amendment to the license.

b. Cooling tower retrofits pose nuclear safety concerns

As a related matter, the draft Rule, particularly the Technical Development Document, implies that the conversion of a nuclear facility from once-through cooling to closed-cycle cooling will not implicate nuclear safety:

> While nuclear safety remains a paramount concern, *it is less clear* that retrofitting a cooling tower would actually have any impact on the safety of the facility. Documentation submitted to the Atomic Energy Commission from Palisades Plant (the lone nuclear facility to undergo a closed-cycle retrofit) indicates that "[t]he existing cooling water system [...] has no safety related functions and the modified system will likewise have no safety related functions."

EPA, Technical Development Document for the Proposed Section 316(b) Phase II Existing Facilities Rule (EPA-821-R-11-001 Mar. 28, 2011) at 6-9, n.12 (hereinafter "TDD") (quoting DCN 10-6888B) (emphasis supplied).

Whether the operation of a facility's condenser cooling system has a safety-related function is neither the beginning nor the end of the inquiry into nuclear safety concerns associated with implementing §316(b). Retrofits with closed-cycle cooling have been determined to be technically infeasible because of the existing nuclear facility's design, e.g., condenser limitations, rendering the technology infeasible as an engineering and nuclear safety matter, e.g., at Entergy's Pilgrim and James A. FitzPatrick stations. *See, e.g.,* Pilgrim Engineering Response at §8; FitzPatrick Response at §6.1.8. Thus, EPA's suggestion that conversion to closed-cycle cooling may not present nuclear safety concerns is incorrect as a matter of fact. Moreover, where closed-cycle cooling implicates service water, nuclear safety considerations are almost always implicated, rendering the draft Rule's application questionable. To that end, we suggest that EPA exclude service water from cooling water in the final rule, which EPA can reasonably do, because service water volumes are nominal—a mere fraction of total water use.

Indeed, EPA's reliance on the single statement in a document from Entergy's Palisades station does not adequately capture the nature of the alleged "retrofit" performed at that facility, when in fact the facility was constructed with the expectation of closed-cycle cooling. Rather, EPA's discussion of the retrofit at Palisades station in the TDD for the 2004 Phase II Rule reflects the correct chain of events, which underscores that no retrofit occurred, and also that the technology decision had nothing to do with §316(b). This order of events is as follows:

- During the initial licensing proceedings for Palisades, citizen organizations sought to limit the thermal discharges from that facility to Lake Michigan. Through a settlement agreement, the facility agreed to adopt a recirculating wet cooling system.
- Procurement and construction of the cooling tower system began in mid- to late-1971.
- The facility began operating in early 1972 utilizing on a temporary basis a once-through cooling system.
- The main portions of the tower system were constructed in 1972 and 1973, while the plant operated in a once-through mode.
- After a ten-month outage, the conversion to a closed-cycle recirculating system occurred in May 1974, when the cooling towers became operational.

See, e.g., TDD at 4-3 to 4-5.

Finally, the conversion process itself can involve site-specific challenges related to site preparation (e.g., blasting or other large scale earth removal near operating reactors) or construction (e.g., the relocation or modification of existing plant facilities) which themselves may impact the safety of the facility. *See, e.g.,* Enercon Engineering Feasibility Report at 25-32 (identifying pipeline relocation and blasting hurdles). Thus, a comprehensive review of all activities necessary to effect the conversion, from site preparation to construction and ultimately operation, should be undertaken as part of the nuclear safety analysis associated with a particular

CWIS technology. Moreover, this analysis should be undertaken pursuant to 10 C.F.R. §10.59. These twin realities further underscore the impropriety of EPA's assumption in the draft Rule.

In its final rule, EPA should: (1) acknowledge that the existence of nuclear-safety implications of closed-cycle cooling retrofits have been established at some nuclear facilities; (2) characterize the Palisades information correctly as a change in design from once-through to closed-cycle cooling made during the construction of the facility and related to thermal discharges; (3) confirm that, in accordance with its corrected facts, the Palisades scenario is not representative of what would occur at nuclear facilities today, most of which have been in operation for decades in reliance on their existing, specially designed systems and configurations; (4) acknowledge that *construction-related* nuclear safety implications may be a second, dispositive nuclear safety consideration; and (5) exclude service water from the cooling water definition.

c. EPA's shellfish requirements are not appropriate for nuclear facilities

The draft Rule focuses on shellfish impingement separately from non-shellfish-related (e.g., fish) impingement, providing:

> The owner or operator of a facility that withdraws water from the ocean or tidal waters must also reduce impingement mortality of shellfish at a minimum to a level comparable to that achieved by properly deployed and maintained barrier nets. Passive screens such as cylindrical wedgewire screens, and through-flow or carry-over free intake screens such as dual-flow screens and drum screens, will meet this requirement.

Draft Rule at 22283 (to be codified at 40 C.F.R. §125.94(b)(2)(iv)).

EPA evaluated the performance of barrier nets—described as those that "encircle the point of water withdrawal from the bottom of the water column to the surface that prevent fish and shellfish from coming into contact with the intake structure and screens"—at five separate fossil-fuel fired facilities. *See* TDD at 6-41 (facility examples were JP Pulliam Station; JR Whiting, Bowline Point, Chalk Point, and Dallman).

Not surprisingly, EPA did not identify any nuclear power plants utilizing barrier nets for impingement reductions. Nuclear plants have specific service water withdrawals that are included in the definition of cooling water, and typically co-located with condenser cooling intakes in an undifferentiated manner. Service water is required to be available on a 24/7 basis in order to cool nuclear safety-related equipment and, therefore, typically fulfills a nuclear safety role. Barrier nets, or any other barrier system that "encircle the point of water withdrawal" from top to bottom, would not be permitted to encircle the service water intakes, given the potential for clogging in the event of a net failure. *See, e.g.,* Pilgrim Engineering Response at §6.2.1; FitzPatrick Response at §6.3.1 (nuclear safety concerns associated with aquatic barrier systems); Enercon Alternative Intake Technologies Report at 76-79. Thus, barrier nets are not obviously an available technology at nuclear power plants with co-located service and cooling water systems.

Moreover, EPA has not evaluated in its shellfish proposal in the draft Rule the costs of barrier technology that implicates reconfiguring and separating existing cooling and service water systems, an approach that implicates nuclear safety considerations and would substantially increase cost estimates.

EPA should recognize this limitation explicitly in the final rule, by: (1) clarifying the potential unavailability concerns with barrier nets for nuclear facilities; (2) reassessing the cost modules for the shellfish options; and (3) on a corresponding basis, exempting nuclear facilities from the shellfish impingement mortality ("IM") requirements, or expressly including shellfish impingement measures as among those that fall within the general nuclear exemption to be codified at 40 C.F.R. §124.94(e).

II. EPA'S APPROACH TO ENTRAINMENT MORTALITY ("EM"), PARTICULARLY CONSIDERATION OF CLOSED-CYCLE COOLING ON A SITE-SPECIFIC BASIS FOR NUCLEAR FACILITIES, WARRANTS FURTHER ATTENTION

a. The draft Rule inadequately addresses the potential unavailability and substantial negative implications of closed-cycle cooling at nuclear facilities, including as applied on a site-specific basis, in cost-benefit analysis and in other exemptions provided for in the draft Rule

Entergy appreciates that the draft Rule provides for consideration of the potentially significant adverse, non-aquatic impacts of technology forcing, *see, e.g.,* draft Rule at 22282-83 ("maximum reduction in entrainment mortality warranted after consideration of all factors"), cost-benefit analysis, *see, e.g., id.* at 22288 (identifying quantified and qualified social benefits and costs of entrainment technologies, electric system reliability and air quality, among other factors), and exemptions; TDD at 6-10 to 6-11. Entergy likewise appreciates the draft Rule's rejection of a national closed-cycle cooling mandate, echoing the 2004 Phase II Rule. *See, e.g.,* draft Rule at 22206-07 (rejecting closed-cycle cooling on a nationwide basis).

However, as an artifact of its selection of Option 1, the draft Rule is equivocal about the role that closed-cycle cooling may play on a site-specific basis, and also fails to delineate fully the proper scope, application and significance of cost-benefit analysis, particularly as that analysis may apply to closed-cycle cooling mandates for nuclear facilities. Moreover, the process in the draft Rule for accounting for non-aquatic benefits of existing nuclear facilities, and the potentially significant adverse environmental impacts of cooling towers within the EM mandates, lacks certainty. As detailed above in Section I and below, Entergy suggests that EPA acknowledge in the final rule that the proposed implementation of closed-cycle cooling at electric generating units is disfavored (with a presumption against its mandate), and that any mandate for this technology be required to establish clear net benefits. Specifically, EPA should acknowledge that existing nuclear power generation, and to a lesser but still important extent, gas-fired generation, offer specific environmental benefits—to electric-system function, air quality and climate change goals—not provided by other sources of baseload power production. The production of reliable, affordable energy, as well as the effects of technology forcing on air quality and climate change goals, merits direct and clear consideration, as EPA implicitly acknowledges. *See, e.g.,* draft Rule at 22288 (expressly accounting for electric system reliability

and air quality as relevant factors in addressing site-specific entrainment determinations). EPA also must acknowledge in the final rule the practical restrictions caused by regional and local restrictions in transmission availability and the exigencies caused by demand load pockets for all fuel types. This is best done on a sector-wide basis for the electric generating sector, with respect to considerations that are undisputed and avoid risk to essential facilities, such as baseload, critical load-following and reserve capacity units, providing an essential service, i.e., electricity, with public health and safety implications.

As detailed in Section I and below, retrofitting facilities, particularly nuclear facilities, with closed-cycle cooling presents the risk of (1) premature or immediate facility closures, such as has occurred at Oyster Creek Station, *see, e.g.,* New Jersey Department of Environmental Protection Draft NJPDES Permit #NJ0005550 (June 1, 2011), Fact Sheet 2-3 (requiring, via incorporation of administrative consent order, closure of Oyster Creek Station 10 years prior to license expiration), (2) extended construction-related outages, and (3) permanently reduced output. Each of these risks presents serious—and in some cases incapacitating—effects on electric system reliability and affordability. The effect of permanent shutdowns is particularly stark within certain regions, typically as a function of local or regional demand and transmission limitations.

National Economic Research Associates ("NERA"), a leading energy and economic consulting firm, the New York Independent System Operator ("NYISO"), which is charged with managing electric-system reliability and affordability within New York State, and the National Academy of Sciences ("NAS") each has determined that nuclear facility closures in the metropolitan New York area will compromise electric-system reliability and further erode affordability. *See, e.g.,* Charles River Associates, *Indian Point Retirement Economic Analysis*, Draft Report 11-15 (July 5, 2011) (Prepared for New York City Department of Environmental Protection); NYISO, *Comprehensive Reliability Plan*, Final Report 18-19 (Jan. 2011); Letter from David Harrison, Jr., Ph.D., Senior Vice President, National Economic Research Associates, Inc. ("NERA"), to New York State Department of Environmental Conservation 6-10 (Apr. 29, 2010) (hereinafter "NERA Letter"); NAS, *Alternatives to the Indian Point Energy Center for Meeting New York Electric Power Needs* 59 (2006) (hereinafter "NAS Alternatives Report"); NERA, *Electricity System Impacts of Nuclear Shutdown Alternatives* 43-44 (Mar. 2002) (Prepared for Entergy Nuclear Indian Point 2, LLC and Entergy Nuclear Indian Point 3, LLC) (hereinafter "NERA 2002 Report"); NERA, *Electricity System Impacts of Certain DEC Utility Choice Alternatives* 30-33 (Oct. 2001) (Prepared for Dynegy Roseton, LLC; Entergy Nuclear Indian Point 2, LLC; Entergy Nuclear Indian Point 3, LLC; and Mirant Bowline, LLC) (hereinafter "NERA 2001 Report"). NYISO's determinations have been unequivocal and consistent, despite recent economic conditions that have temporarily reduced historic demand expectations in the metropolitan New York region, and must be accounted for in the draft Rule beyond the National Energy Reliability Council ("NERC") projections that EPA has performed, because they offer a level of analysis and understanding of regional conditions, including voltage, transmission and capacity constraints, that are beyond what a NERC-level analysis reasonably can be expected to or actually does provide. Further, the fact that NYISO's analysis is validated by independent analyses performed by the Charles River Associates (on behalf of the New York City Department of Environmental Protection), NERA and the NAS renders the question of the potential adverse impacts of nuclear shut-downs in metropolitan New York indisputable.

Substantial construction outages beyond planned or scheduled maintenance outages function essentially as temporary shut-downs, but may be exacerbated in regions where transmission constraints and barriers to siting new facilities exist (typically, urban areas), particularly if such areas are experiencing demand growth and/or capacity reductions through planned retirements. This is because new facility siting is unlikely to be undertaken for a temporary outage, which means that existing power stations, typically fossil-fuel facilities, will provide the needed interim power without resort to new facilities. But, even this can occur only if, and to the extent that, regional and local transmission constraints allow. For this reason, the potential impacts to electric system reliability and affordability of a substantial construction outage mirrors that of a shut-down scenario, but can be even more extreme in the short term. *See, e.g.,* NERA 2001 Report at 12, 29 (comparing impacts to price and reliability of electricity as a result of permanent shut-down of six New York utilities to impacts from an annual 32-week outage of same six utilities). Further, where these outages are significant in length, as is the case for nuclear facilities considering closed-cycle cooling retrofits, avoiding peak demand periods (which tend to coincide with construction seasons) is unlikely to be possible, magnifying potential impacts to reliability and affordability. In many areas and conditions, particularly those in large metropolitan areas, reduced reliability can have direct and dire human consequences, particularly for the elderly, handicapped and economically disadvantaged populations. (Loss of electricity in high-rise residential structures can produce rapid ambient temperature increases in dwellings, e.g., as air conditioning ceases to operate, as elevators cease performing beyond their emergency capacity.) As EPA acknowledges, the draft Rule will effect 45% of the nation's total existing generating capacity. *See, e.g.,* EPA, Economic Benefits Analysis for Proposed Section 316(b) Existing Facilities (EPA 821-R-11-003, Mar. 28, 2011) at 1-2 (hereinafter "EBA"). Thus, potential adverse impacts of facility outages may be far more severe than EPA's assessment acknowledges, e.g., where compliance deadlines must be met by multiple facilities in the same transmission region or local load pocket essentially at the same time.

Moreover, the level of uncertainty associated with nuclear facility retrofits of closed-cycle cooling compounds the likelihood that outages will be more, rather than less, severe, and that unanticipated closures may result. *See, e.g.,* Enercon Engineering Feasibility Report at 54-55. This is because such retrofits, which represent major projects, have not been performed at nuclear facilities, underscoring the potential for construction-related delays that tend to be reduced only through substantial experience that the sector does not possess. *See id.* It is also because such large-scale retrofits are highly site-specific, with construction-related conditions, such as blasting, zoning, sound and aesthetic considerations, determined by site conditions (e.g., substrate and size of the facility location), surrounding considerations (e.g., community character and view sheds), and local regulators (e.g., municipalities). *See id.* In any event, and without accounting for these uncertainties, construction-related outages are expected to exceed 42 weeks at minimum at Indian Point. *See id.* EPA must account for this timeline, and its electric-system implications, in the final rule.

Assuming that closed-cycle cooling can be installed, permanent power output reductions also must be reckoned with. Enercon has estimated that a closed-cycle cooling retrofit at Indian Point would result in two forms of output reductions, one related to diversion of electricity to operate cooling tower equipment ("parasitic loss"), and the other associated with the loss in generating

capacity attributable to the operation of that equipment, which varies over time, but reaches its peak during peak summer demand period ("derating"). *See, e.g.,* Enercon Engineering Feasibility Report at 56. At Indian Point, these reductions are substantial: Combined parasitic losses at Unit 2 and 3 are 72.2MW, and combined deratings range from 15.8MW to 85.4MW, with deratings highest during summer (and, therefore, peak demand) periods, with cumulative losses of 88MW to 157.6MW. *Id.* at 51-52. These sizeable permanent losses, which represent substantial impacts to the facilities themselves, must be replaced by other facilities, likely fossil-fuel facilities. *See, e.g.,* NERA Letter (discussing critical role Indian Point plays in maintaining mandatory reliability thresholds for energy generation in New York and replacement needs in its absence); NERA 2002 Report (same); NERA 2001 Report (same). Replacing existing, dependable nuclear and fossil-fueled baseload facilities also represents a net loss of electric-system portfolio diversity, creates challenges to national goals of reducing the United States' reliance on foreign oil, taxes over-constrained natural gas transmissions systems at capacity (particularly during peak demand periods in the Northeast), diverts supply to liquefied natural gas ("LNG") facilities, and encourages reliance on foreign power sources through transboundary electricity generation sources, all with recognized adverse reliability and affordability implications. *See, e.g.,* NERA Letter at 12 (nuclear plant retirement is a concern for fuel diversity and exacerbating existing dependence on natural gas); The President, National Security Strategy 30 (May 2010) (reduced dependence on foreign oil is a national security strategy); *see also* Department of Energy, Notice of Intent To Prepare an Environmental Impact Statement and To Conduct Public Scoping Meetings, and Notice of Floodplains and Wetlands Involvement; Champlain Hudson Power Express, Inc., 75 Fed. Reg. 34720 (June 18, 2010) (providing overview of the Champlain Hudson project to import electricity from Canada to New York, employing electricity supply sources with unanalyzed and indeterminate potential reliability, cost and environmental impacts).

Air quality implications of the draft Rule, likewise, warrant direct and clear consideration in the final rule. By way of background, of the three facility types that comprise approximately 90% of the total energy generation in the United States, nuclear facilities are the only facilities currently capable of generating reliable, baseload electricity without the emission of regulated air pollutants, such as sulfur dioxide ("SO2"), oxides of nitrogen ("NOx"), and mercury ("Hg"). *See* EBA at 2H-9 (providing statistics on energy generation by facility type); NERA Letter at 16 (nuclear generation "does not produce CO_2, NO_x, SO_2 or any other air emissions"); NAS Alternatives Report at 51 to 52 (comparing air emissions between power generation sources). To that end, any direct or indirect effect of the draft Rule that reduces the net output of nuclear facilities, either through closure, outages or deratings, will require offsetting increases in power generation from other facilities. Such offsetting electricity likely will come from the fossil fuel sector, and, therefore, result in increases in greenhouse gases and other regulated air pollutants, thus undermining new air quality initiatives targeted at these emissions, including progress toward National Ambient Air Quality Standards ("NAAQS") and climate change goals. *See, e.g.,*NERA Letter at 14-17 (closure of Indian Point facility "would require [] fossil-fueled sources of generation" and "adversely affect the state's ability to meet its environmental goals," including CO_2 reductions under the Regional Greenhouse Gas Initiative). As EPA has acknowledged, the adverse air quality impacts that can arise from §316(b) requirements may be substantial.

In addition to the air quality impacts of reduced nuclear station operation, cooling towers can be independent and substantial sources of regulated air pollutants, including PM10 and PM2.5. TRC Companies, Inc. ("TRC"), a leading air quality consultant, has evaluated on a theoretical basis potential PM emissions associated with operation of cooling towers of a configuration and size capable of addressing cooling water needs at Indian Point (albeit incompletely), and concluded that permitting cooling towers in compliance with state and federal Clean Air Act requirements, such as NAAQS, is not possible, and, even if permittable, represents a significant adverse impact to human health and the environment. *See, e.g.,* TRC Cooling Tower Analysis at 3-14, 5-1; Enercon Services, Inc., *Analysis of Closed-Loop Cooling Salinity Levels, Indian Point Units 2 and 3* iii-iv (Nov. 2010) (Prepared for Entergy Nuclear Indian Point 2, LLC and Entergy Nuclear Indian Point 3, LLC). These conclusions mirror the earlier findings by TetraTech Inc., on behalf of California regulators, with respect to closed-cycle cooling and PM10 emissions. *See, e.g.,* Tetra Tech Inc., *California's Coastal Power Plants: Alternative Cooling System Analysis* 3-11 to 3-12, 4-8 to 4-9 (Feb. 2008) (Prepared for California Ocean Protection Council) (identifying permitting difficulties associated with PM10 emissions from cooling towers). From this information, the adverse air quality impacts that may arise from a §316(b) cooling tower mandate are again substantial.

To address these potential electric system and air quality considerations, among other factors, EPA should consider: (1) expressly limiting the scope of the "best technology available" at electric generating units to technologies where no significant temporary or permanent net loss of generating capacity and/or significant increase in air contaminants or greenhouse gases results, with a presumption against closed-cycle cooling retrofits at nuclear facilities; and/or (2) faithfully applying (through specific direction to permitting authorities) its site-specific exemptions (on a cost-benefit basis) to underscore the legal and practical effects of these countervailing—and in many cases overriding—adverse environmental impacts.

b. The factors for consideration in developing site-specific EM controls are both under and over inclusive and inconsistent with the draft Rule's data submission requirements

The draft Rule requires EPA to determine EM BTA standards for existing facilities on a site-specific basis, based on a "determination of the maximum reduction in [EM] warranted after consideration of the factors relevant for determining [BTA] at each facility." Draft Rule at 22288 (to be codified at 40 C.F.R. §125.98(e)). The draft Rule states only that the

> determination in the fact sheet or statement of basis must be based on consideration of the following factors: (1) numbers and types of organisms entrained; (2) entrainment impacts on the waterbody; (3) quantified and qualitative social benefits and social costs of available entrainment technologies, including ecological benefits and benefits to any threatened or endangered species; (4) thermal discharge impacts; (5) impacts on the reliability of energy delivery within the immediate area; (6) impact of changes in particulate emissions or other pollutants associated with entrainment technologies; (7) land availability inasmuch as it relates to the feasibility of entrainment technology; and (8) remaining useful plant life; and (9) impacts on water consumption.

Draft Rule at 22288 (to be codified at 40 C.F.R. §125.98(e)). While Entergy supports a site-specific approach to EM controls, it believes the draft Rule does not include all relevant factors, lacks sufficient guidance on applying the relevant factors, and does not appropriately detail the scope and extent of some of these impacts, particularly at nuclear facilities.

The breadth of data submission requirements suggests a cost-benefit analysis will be used in a site-specific determination for EM BTA standards. Yet, the minimum factors required for consideration in the fact sheet do not provide for cost-benefit analysis, provide no direction as to how to balance costs and benefits, and confer on EPA the authority to decline to prepare and/or rely on a cost-benefit analysis. While the draft Rule states that "[t]he Director *may* reject an otherwise available technology as BTA standards for [EM] if the social costs of compliance are not justified by the social benefits," draft Rule at 22288 (to be codified at 40 C.F.R. §125.98(e)) (emphasis supplied), this consideration by the Director is apparently discretionary, with no right conferred on the applicant to require such an analysis by providing relevant application information. The final rule must clarify that a site-specific EM determination is the right of the applicant, must include consideration of all holistic environmental considerations, and must be based on a cost-benefit analysis, such that a net positive benefit is achieved based on analysis of data submitted pursuant to the provision to be codified at 40 C.F.R. §125.95. We specifically suggest adding the following language (in bold) to §125.98:

> "The Director **shall** reject an otherwise available technology as BTA standards for [EM] if the social costs of compliance are not justified by the social benefits … ."
>
> "Entrainment mortality controls must reflect the Director's determination of the maximum reduction in EM warranted after consideration of the factors relevant for determining BTA at each facility, **pursuant to data submissions required in 40 C.F.R. §125.95**."

Further, a number of the relevant factors are not appropriate for consideration in the §316(b) context. Specifically, EPA should eliminate the requirements to consider:

> (3) . . . benefits to any threatened or endangered species; [and]
>
> (4) thermal discharge impacts.

Draft Rule at 22288 (to be codified at 40 C.F.R. §125.98(e)). As discussed below and not repeated here, neither species that are protected by the Endangered Species Act ("ESA"), 16 U.S.C. § 1531 *et seq.*, nor thermal discharges, are properly addressed pursuant to §316(b), but rather receive thorough consideration under their respective acts and sections.

c. EPA's modules for compliance times for closed-cycle cooling are unsupported

As summarized above, conversion to closed-cycle cooling at Indian Point was estimated by Enercon to require a minimum of 42 weeks of downtime, with substantial uncertainties likely to increase, not reduce that outage period. *See* Enercon Engineering Feasibility Report at 46-48, 54-55. While every facility may have site-specific siting considerations, as discussed above, the

magnitude of these projects (especially at nuclear and other baseload facilities), in conjunction with the lack of history of such retrofits at nuclear facilities, means that downtime at most facilities is likely to be longer than predicted.

Enercon's estimate is significantly longer than EPA's estimate of 0-24 weeks (beyond scheduled maintenance outages) for installation of cooling towers at nuclear facilities. *See* EBA at 3-11. EPA's estimate for cooling tower installation time at nuclear facilities is based on an inappropriate assumption that installation of closed-cycle cooling would always occur during either extended capacity upratings ("ECUs"), which already have occurred at many facilities nationwide and also are not certain to occur at other facilities, or during In-Service Inspections ("ISI"), which occur every five years and typically last 8-16 weeks. *See* EBA at 3-10. EPA provides no basis for this assumption, however, and the draft Rule does not base compliance deadlines around scheduled ECUs or ISIs. Even with respect to scheduled maintenance outages, EPA's position is untenable, as these outages routinely are performed by the nuclear fleet in a three to four week period every two years. As a result, EPA's assumption is unsupported and significantly underestimates the necessary downtime and corresponding impacts of cooling tower installation, particularly for nuclear and other comparable baseload facilities.

For these reasons, EPA should include these appropriate timeframes, with appropriate uncertainty considerations, and the corresponding impacts (including costs) of such timeframes, in the final rule.

d. EPA's cost modules for closed-cycle cooling are unrealistic

EPA concluded that electric generation sector's estimated compliance costs *nationwide* (i.e., on a cumulative basis) for closed-cycle cooling range from $4.9 to $5.1 billion for cooling towers ($3.3 to $3.4 billion, after tax), all in $2009 (assuming a 2012 promulgation year). *See, e g.,* EBA at 3-22 to 3-23 (compliance costs for Option 2 and 3, which would require closed-cycle cooling for electric generators withdrawing greater than 125 MGD). EPA acknowledges that its data, particularly for closed-cycle cooling, is dated and based on minimal facility information, *see, e.g., id* at 3-25, includes interpolation errors, *see, e.g., id* at 3-25, relies on implicitly analyzed facilities, *see, e.g., id* at 3-26, and includes high variability in downtime cost assessments, *see, e.g., id* at 3-26. EPA does not include compliance costs for specific technologies and instead makes generalized estimates of costs for all facilities. We appreciate EPA's candor, but believe that cost assessments can and should include relevant and correct information, particularly for nuclear facilities.

To that end, Enercon's detailed estimate of the costs of conversion to closed-cycle cooling at Indian Point reflects substantial capital costs of $1.2 billion, with substantial uncertainties likely to increase, not reduce, those costs. *See* Enercon Engineering Feasibility Report at 46-48, 54-55; *see also* Pilgrim Engineering Response at Attachment 4 (providing cost assessment for conversion to closed-cycle cooling); FitzPatrick Response at Attachment 4 (same). Enercon has not evaluated the costs of electricity replacement during the substantial outage periods discussed above, but NERA has addressed these costs at Indian Point and determined that replacement costs may meet or exceed capital costs under the evaluated conditions. *See, e.g.,*

NERA Letter at 10-11 (discussing replacement costs in the event of Indian Point facility shut-down).

In short, EPA's and Enercon's capital cost estimates are not reconcilable, and the agency's estimates would be substantially higher if it employed costs comparable to Indian Point for all nuclear facilities (on a MW or flow basis). *See* Enercon Engineering Feasibility Report at 56 (providing $1.19 billion estimate of minimum "direct overnight capital cost" to convert Indian Point, with a net capacity of 2158 MW, to closed-cycle cooling); the same principle holds for downtime costs; *see also* Pilgrim Engineering Response at Attachment 4 (providing cost assessment for conversion to closed-cycle cooling); FitzPatrick Response at Attachment 4 (same). For these reasons, EPA's cost assessments should include the Enercon and NERA estimated costs, with appropriate uncertainty considerations, in the final rule.

e. EPA appropriately recognizes that evaluation of the draft Rule's benefits requires a time profile that considers when compliance-related changes occur

As discussed above, EPA is not clearly required to undertake cost benefit analyses for site-specific EM determinations, an omission that should be remedied to ensure that such analyses are performed. However, and to its credit, in analyzing the draft Rule's IM and EM reduction benefits, EPA develops a time-based profile of total benefits that reflects when potential benefits from technology-related changes at each facility may be realized. *See, e.g.,* EEBA at 10-4. implicit in this analysis, as EPA is correct to recognize, is the truism that potential aquatic benefits realized are correlated to the time of installation of a technology. However, EPA's analysis must go farther to note that varying compliance times may support installation of technology that is installed earlier or with fewer uncertainties, such that potential benefits will accrue earlier and with clearer certainty, compared to technologies with longer installation periods that postpone potential benefits for a significant number of years or create uncertainty as to whether the assumed benefits ever will be realized. As a result, more readily installed technologies may achieve greater comparative benefits, even if the readily installed technologies have fewer immediate IM and EM reductions on an operational basis. This comparison is particularly relevant for nuclear facilities, which operate under clearly defined time-limited licensing periods (of forty years for an initial license, and twenty years on license renewal).

Entergy's leading national fisheries consultants performed a comparison of potential benefits of installing cylindrical WWS and closed-cycle cooling at Indian Point that demonstrates the effect of installation time (and therefore cumulative benefits). At Indian Point, WWS have the potential to minimize impingement and entrainment losses of age one equivalents from the regulatory baseline (as determined by regulators under the previous 2004 Phase II Rule) by approximately 99% and 90% on an annual basis, respectively, which is comparable to closed-cycle cooling on an annual basis and far exceeds closed-cycle cooling on a time-analyzed (or cumulative) basis. *See, e.g.,* Enercon Alternative Intake Technologies Report at v, 118. This is in part because closed-cycle cooling takes significantly longer to install (installation in 2029, assuming a start date of 2016) than does WWS (installation in 2013 and 2015 at Indian Point Units 2 and 3, respectively). *Id.* at 118. Cumulatively, for example, WWS will achieve entrainment reductions of 87% measured in age one equivalents over the twenty year license renewal period for Indian Point, whereas closed-cycle cooling would only achieve cumulative

benefits of 50% during the same period. *Id.* As this analysis reflects, closed-cycle cooling should be highly disfavored, even if it were feasible and did not present the various other significant adverse impacts that it entails, on an IM and EM performance basis.

To ensure that potential benefits are real, not fictional, the final rule should account for cumulative benefits resulting from use of readily installed technologies over technologies with longer installation times.

III. IMPINGEMENT MORTALITY DESERVES FURTHER CONSIDERATION

a. Modified traveling screens and fish return systems should–without more–satisfy BTA for impingement

EPA selected what it refers to as modified traveling screens and fish return systems as the best technology available for minimizing IM, noting as follows:

> EPA's analysis identified modified Ristroph screens as the technology basis for impingement mortality BTA requirements for all existing facilities.
>
> . . .
>
> The impingement mortality requirements considered are based on 'modified traveling screens.' Modified traveling screens include all of the "Ristroph" and "Fletcher" modifications including: smooth mesh; a low pressure wash spray designed and operated for gentle removal of impinged organisms; and a bucket and/or lip design that maintains adequate water to promote survival of impinged organisms. Modified traveling screens also includes a fish handling and return system that is designed, maintained, and operated to ensure adequate water to promote return of impinged organisms to the source water body; minimized predation of the collected impinged organisms; and a discharge location of the fish return that is sufficiently far from the cooling water intake to minimize re-impingement.

TDD at 7-1 to 7-2. EPA analyzed the performance of this technology suite for purposes of establishing national performance standards for IM under the draft Rule; specifically, EPA-specified IM performance standards of 12% on an average annual basis and 31% on a monthly basis. *See* draft Rule at 22282 (to be codified at 40 C.F.R. §125.94(b)(1)(i)).

The Fletcher-"modified" screens that EPA references are those at Indian Point, which Dr. Fletcher and Entergy's professional consultants determined were optimized for IM reductions. Indeed, Dr. Fletcher published a peer-reviewed article indicating that the technology could not be further optimized. *See* Ian Fletcher, *Flow Dynamics and Fish Recovery Experiments: Water Intake Systems*, TRANSACTIONS OF THE AM. FISHERIES SOC'Y, 393, 414-15 (May 1990). Thus, EPA and the consulting community have recognized that the Indian Point technology suite is as best as can be achieved at that facility and, presumptively (or absent a contrary demonstration), on a nationwide basis. Because they form the basis for the IM performance standards and have

been determined to be optimized already, installation and operation of modified traveling screens and fish return systems of the type described above should automatically constitute compliance with BTA requirements for impingement. Instead, however, each of the four Options presented by EPA requires compliance with the IM performance standards—even in cases where a facility currently includes or subsequently installs the very systems on which EPA based those standards. *See* TDD at 7-3, 7-4 (discussing each Option). EPA clearly should indicate that any facility installing and operating these screens and fish return systems has satisfied the IM BTA requirements, and need not demonstrate compliance with the performance standards.

Otherwise, facilities could be unwittingly put in the problematic position of (a) having adopted the very technology on which EPA based the performance standards, and (b) being subject to enforcement for technology that does not meet the performance standards, but already has been optimized (such that further reductions are not achievable).[2] This is not an unlikely scenario, given that EPA considered data from only three facilities—all from a single state—when developing the performance standards. *See, e.g.,* TDD at 11-6. Further, EPA expressly excluded data from other facilities with the optimized technology for which impingement data were available, and which reflected lower IM reductions on an annual and monthly basis, *see* TDD at 11-5, and also "excluded studies showing poorly performing screens from its data set." TDD at 7-2 n.3. Thus, it is likely that facilities installing the very EPA-selected technology nonetheless may not meet the proposed IM performance standards. This not only underscores how a facility with the optimized technology should not be required to perform operational monitoring, but also underscores that EPA's IM performance standards are not supported and must be modified to reflect what the selected technology actually and reasonably can achieve.

If EPA will not equate installation of optimized Ristroph screens and fish return systems with compliance with BTA requirements for impingement, then it must revisit and expand its analysis of the performance of these screens before adopting unrealistically high performance standards on a nationwide basis. The better course would be for EPA to collect performance data from a statistically significant number of facilities on a variety of waterbodies before reaching any conclusions as to the performance of this (or any other) technology.

b. The draft Rule fails to address the site-specific variability of IM impacts

EPA's proposed IM proposal also fails to address the site-specific nature of IM impacts. *See, e.g.,* EEBA at 3-15 (acknowledging limitations and uncertainties in EPA's IM analysis due in part to the complex natural system and the fact that facilities do not operate identically on an annual basis). Since potential IM impacts are site-specific, any technology forcing should allow a site-specific exemption, where appropriate, e.g., where IM is nominal. For instance, at some

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[2] Experience indicates that this (a given technology's potential not to perform as expected at a given facility) is why EPA seldom prescribes the use of a particular technology and, instead, develops a performance standard based on its study of available technologies. Here, however, EPA has cast its lot with a particular technology, but then set performance standards based on an extremely narrow data set that cannot rationally be argued to represent the variety of situations that traveling screens and fish return systems will encounter across the nation. If EPA remains committed to asserting that modified traveling screens and fish return systems "set the standard," then, by definition, facilities should be able to depend on the performance of that technology to satisfy §316(b) for IM. If this is not the case, EPA must reassess the performance standards to set standards that accurately reflect BTA.

facilities the cost of modifying traveling screens and installing a fish return system, as required by the draft Rule, *see* draft Rule at 22282-83 (to be codified at 40 C.F.R. 125.94(b)(1)&(2)), may outweigh the benefits, particularly if a facility is already meeting established IM performance standards. EPA should acknowledge these possibilities by providing in the final rule a safe-harbor for those facilities that can demonstrate the costs of installing modifying traveling screens and a fish return system outweigh the benefit of their installation at a particular facility, or substantially exceed EPA-estimated costs.

EPA's estimates of average net downtime for installation of IM reduction technologies is also incorrect, in part based upon inappropriate assumptions. First, EPA assumes that installation of IM technologies would take place during installation of cooling towers, if towers are required, and, therefore, no additional net downtime will be attributed to these facilities. EBA at 3-10. EPA's assumption is highly problematic, since it has rejected closed-cycle cooling on a nationwide basis, and, as discussed above, such technology is inappropriate for nuclear and many other facilities. Moreover, EPA's approach does not make sense in light of the draft Rule's different compliance timelines for IM and EM technologies. *Compare* EBA at 3-17 *and* draft Rule at 22282 (to be codified at 40 C.F.R. 125.93(a)). EPA also assumes nuclear facilities that do not require cooling towers will install IM technologies during an ISI, and, therefore, identifies no additional net downtime for IM technologies. EBA at 3-10. As discussed above, this latter assumption is also unsupported, because there is no reasonable basis for assuming that installation timing will line up with the 5-year ISI window.

Likewise, EPA's estimates of certain IM technology costs do not reflect cost and feasibility studies conducted for nuclear facilities, or the actual installation costs of these technologies at nuclear facilities, including at the Indian Point, Pilgrim and FitzPatrick stations. *See, e.g.,* Enercon Alternative Intake Technologies Report at 34 (providing capital cost estimates for installation of alternative CWIS technologies at Indian Point); Pilgrim Engineering Response at Attachment 4 (providing capital cost estimates for installation of alternative CWIS technologies at Pilgrim Nuclear Power Plant); FitzPatrick Response at Attachment 4 (providing capital cost estimates for installation of alternative CWIS technologies at FitzPatrick Nuclear Power Plant).

In the final rule, EPA should clarify the IM exemptions to reflect site-specific factors, including installation times and costs, with appropriate uncertainty considerations.

IV. IMPINGEMENT, ENTRAINMENT AND ADVERSE IMPACT CONSIDERATIONS

a. There is simply no support for EPA's statements that impingement and entrainment mortality directly impact fish populations.

EPA maintains that IM and EM have "immediate and direct effects on the population size and age distribution of affected species," EEBA at 2-9, but later admits that it "assumed that I&E mortality losses resulted in a reduction in the number of harvestable adults." EEBA at 3-5. Moreover, as EPA stated:

> It is fundamentally difficult to demonstrate a causal relationship between a single stressor and changes in fish population sizes. Fish populations are affected by

> multiple nonlinear stressors and are constantly in flux. As such, determining whether changes to fish populations are the consequence of an identifiable stressor due to natural fluctuation around an equilibrium stock size is difficult. Fish recruitment is a multidimensional process, and identifying and distinguishing the causes of variance in fish recruitment remains a fundamental problem in fisheries science, stock management, and impact assessment (Boreman 2000; Hilborn and Walters 1992; Quinn and Deriso 1999). Consequently, resolving issues of population fluctuation was beyond the scope and objectives of EPA's Section 316(b) benefits analysis.

Id. In other words, while EPA asserts that IM and EM may alter population size and distribution, it does so without any technical basis, rather simply assuming that populations are reduced as a result of impingement and entrainment, even though "population fluctuation was beyond the scope and objectives" of its benefits analysis. *Id.* Put simply, EPA does not know and has not analyzed whether IM and EM affects population abundance.

While it may be difficult to prove a causal relationship between a single stressor and population size under certain circumstances, the question of whether impingement and entrainment *may have been* responsible for changes in fish populations is capable of being answered. In their comprehensive impact assessment, *see* AEI Report, a team of leading biological consultants from diverse firms evaluated the long term Hudson River biological monitoring data—widely recognized as the most comprehensive dataset of its kind—and tested a variety of appropriate impact hypotheses, by evaluating whether any statistically significant correlation was present between a particular stressor (e.g., impingement and entrainment mortality, fishing, striped bass predation, etc.) and the abundance of fish populations in the Hudson River. *See* AEI Report at 1. Their investigation found no evidence supporting the hypothesis that impingement and entrainment contributed to any changes in the abundance of evaluated fish populations or communities in the Hudson River. *Id.* at 1, 78. Thus, this comprehensive study of more than thirty years of fisheries data on the Hudson River does not support EPA's assumption that impingement and entrainment adversely impact fish populations.

EPA's unsupported assumption to the contrary also leads to substantially overstated benefits associated with reductions in impingement and entrainment. The use of the "simple trophic transfer model," EEBA at 3-3, is based upon alleged increases in commercial and recreational fish harvests that would result from "compliance" with the draft Rule, all based upon the assumption that increased commercial and recreational catches would, in fact, result from a reduction in impingement and entrainment. Although even these flawed estimates of commercial and recreational fishing benefits are modest in comparison to the high costs of the draft Rule, *compare* draft Rule at 22211 (estimating hypothetical annual compliances costs ranging from $480 million to $762 million under preferred Option 1) *to* EEBA at Chapters 6 and 7 (analyzing commercial and recreation fishing benefits of Options 1-4), they become even less justifiable in light of actual data analysis provided in the AEI Report, which underscores that assumed increases may be just that, i.e., assumed, not real.

b. EPA's presumption that entrainment leads to 100% mortality is indefensible

Like the previous 2004 Phase II Rule, the draft Rule presumes entrainment leads to 100% mortality, which EPA defends by noting that it "has not received any new data on this issue and, as such, has not altered its conclusion." TDD at 2-19. EPA's position on entrainment survival was indefensible in 2004, and remains indefensible now. EPA's own peer reviewers of the 2004 Phase II Rule concluded that they could not support EPA's "zero survival" presumption. *See* Peer Review Comments of Greg C. Carman, Docket Number OW-2002-0049-1400 at 2 (noting he was "not convinced that EPA's case had been demonstrated to a sufficiently high standard); Peer Review Comments of Charles H. Hocutt, Docket Number OW-2002-0049-1399 at 6 ("[I]f the available data are unsuitable for developing unbiased estimates of entrainment survival, it follows that they are unsuitable as well for assuming zero percent survival."); Peer Review Comments of Mark B. Bain, Docket Number OW-2002-0049-1398 at 3 (concluding, after performing several statistical analyses on the survival estimates, that EPA's zero survival assumption may be rejected "at a high level of confidence" and an assumption of at least 23% survival was the most appropriate value but 25% would be acceptable). Thus, EPA's presumption is not valid, the implications of which are significant, e.g., in EPA's nationwide benefits analysis, the benefits of EM controls are overstated, potentially by as much as 23-25%. EPA should allow entrainment survival to play a meaningful role in the final rule, and should itself abide the consensus of the peer reviewers, including by factoring entrainment survival into its benefits assessment, rather than reflexively assume that entrainment survival is zero (or at least provide a range of benefit figures that account for zero survival and the most appropriate 23-25% survival figures).

On a site-specific level, while the preamble to the draft Rule states that facilities will be allowed "to demonstrate, on a site-specific basis, that entrainment mortality of one or more species of concern is not 100 percent," *see* draft Rule at 22188, the draft Rule includes the presumption of, and exception to, 100% EM in a section that is only applicable to new units at existing facilities. *See* draft Rule at 22286 (to be codified at 40 C.F.R. §125.96(b)(2)). In the final rule, EPA must clarify that existing facilities may also demonstrate, on a site-specific basis, that EM is less than 100%.

V. LEGAL CONSIDERATIONS IN THE SCOPE AND APPLICATION OF THE DRAFT RULE

a. EPA's application of the draft Rule to existing facilities lacks credible grounding in the Clean Water Act (the "Act")

In its comments on the 2004 Phase II Rule, now suspended and superseded by the draft Rule, Entergy identified the limitations on the application of §316(b) to existing facilities. Briefing of this issue occurred in some of the subsequent federal court proceedings surrounding the 2004 Phase II Rule and related regulations. *See, e.g.,* Correspondence from Elise N. Zoli, Counsel for Entergy Corp. to Proposed Rule Comment Clerk W-00-32, EPA, submitting comments re: EPA ICR #2060.01 (Aug. 7, 2002); Riverkeeper, Inc. v. EPA, Dockets No. 02-4005, 02-4047 (2nd Cir. Jan. 09, 2002); Correspondence from Elise N. Zoli, Counsel for Entergy Companies to Water Docket, EPA, submitting comments re: EPA Docket ID No. OW-2002-0049 (June 2, 2003); Riverkeeper, Inc. v. USEPA, 358 F.3d 174 (2nd Cir. 2004) ("Riverkeeper I"); ConocoPhillips Co. v. USEPA, Docket No. 06-60662 (5th Cir. Jul. 14, 2006); Riverkeeper, Inc.

v. USEPA, 475 F.3d 83 (2nd Cir. 2007) (''Riverkeeper II''), *cert. granted* Entergy Corp. v. USEPA, 128 S. Ct. 1867, Docket No. No.07-588 (2008); Entergy Corp. v. Riverkeeper, Inc., 129 S. Ct. 1498 (2009) (United States Supreme Court did not address the issue in ruling relating to the 2004 Phase II Rule, with the result that the Second, Fourth, Seventh and DC Circuit Court variability and contraindications on this issue remain). Entergy hereby incorporates its prior comments and prior positions in the foregoing judicial proceedings to the full extent provided by applicable law, including Entergy's previous position that the National Pollution Discharges Elimination System ("NPDES") program is not the appropriate vehicle for implementation of §316(b).

b. State's purported entitlement to more stringent requirements under §510 of the Act is not supported in the statute or applicable law

In the draft Rule, EPA expressly reserves each state's rights to enforce more stringent requirements under §510 of the Act, 33 U.S.C. §1370, in a manner that is not consistent with the limitations of that Section to discharges of pollutants (as distinct from CWIS or intake considerations). *See, e.g.,* draft Rule at 22280 (to be codified at 40 C.F.R. §125.90(c)). Section 510 allows states to promulgate more stringent standards relating to "discharges of pollutants," and to control or abate "pollution," implicating the definitions of "pollutant," itself limited to discharges. *See, e.g.,* 33 U.S.C. §§1362(6) (defining the term "pollutant" in a manner clearly limited to discharges), (12) (defining the terms "discharge of pollutant" and "discharge of pollutants" in a consistent manner as implicating solely the addition of pollutants to navigable waters), (16) (defining the term "discharge" as "discharge of a pollutant" or "discharge of pollutants") and (19) (defining the term "pollution" in a more ambiguous manner reconcilable with the foregoing). We respectfully request that EPA, in the final rule, address the basis for its application of §510 to non-discharge, CWIS circumstances.

c. The draft Rule inappropriately includes potential impacts to species regulated under the ESA

The draft Rule and associated supporting documents, including the TDD, acknowledge that the ESA is an "other legal requirement," and, as such, not included in the Act's NPDES permitting scheme to which the draft Rule applies. *See, e.g.,* TDD at 3-5 to 3-6. The draft Rule, however, contains multiple statements that indicate that ESA species are species of special concern, and includes potential impacts to ESA species as factors to be considered in establishing requirements and undertaking technology-forcing decisions under §316(b). *See, e.g.,* draft Rule at 22288 (to be codified at 40 C.F.R. §125.98(e)(3)) (requiring consideration of "benefits to any threatened or endangered species"); at 22276 (to be codified at 40 C.F.R. §122.21(r)(4)(vi)) (requiring identification of "all threatened, endangered, and other protected species that might be susceptible to impingement and entrainment at [] cooling water intake structures"); at 22284 (to be codified at 40 C.F.R. §125.95(b)(1)) (requiring compliance with §122.21(r)(4)(vi)); *see also* draft Rule at 22287 (to be codified at 40 C.F.R. §125.98(c)) (identifying ESA species as "species of concern"); Am. Forest and Paper Ass'n v. USEPA, 137 F.3d 291 (5th Cir. 1998) (holding that EPA exceeded its statutory authority by requiring that Louisiana's delegated §402 NPDES program must include a provision requiring ESA consultation for permit issuance, as ESA consultation was not required for state program approval by §402(b)).

While endangered or threatened species may be considered species of concern on a site-specific basis, it is inappropriate to automatically give endangered or threatened species elevated status and consideration under the draft Rule. Instead, the ESA establishes the federal framework for prohibiting taking of ESA species, the limited circumstances in which such takings are authorized, and the enforcement mechanisms for violation of that act. *See* 16 U.S.C. §1531 *et seq.* Absent EPA's conclusion that management of ESA species under that federal law is not occurring in an appropriate manner, there is simply no reasonable, nor jurisdictional, basis for EPA's incorporating the ESA into the draft Rule. Indeed, there is no statutory basis under §402 of the Act, 33 U.S.C. §1342, for EPA to regulate ESA species under the NPDES program, which forms the EPA's stated basis for regulation of CWIS in the draft Rule. *See, e.g.,* 33 U.S.C. §1326(b) and 1342(a) (containing no reference to the ESA among the list of requirements with which either §316(b) or §402 N/SPDES permits must establish compliance); 33 U.S.C. §1342 (conferring no authority on EPA to administer the ESA in the context of §316(b)). Rather, we are confident that the ESA will be applied to address ESA species at facilities subject to the draft Rule in a proper and independent manner, by the relevant federal and state agencies with authority under the federal act and its state analogs.

Therefore, special consideration of and requirements relating to ESA species should not be incorporated in the final rule.

d. The draft Rule inappropriately includes thermal considerations addressed through §316(a)

Similarly confounding is EPA's proposal to include "thermal discharge impacts" as among the factors to be considered when determining site-specific EM controls. *See* draft Rule at 22288 (to be codified at 40 C.F.R. §125.98(e)). Thermal discharges and their related impacts are regulated under §301 and §316(a) of the Act, 33 U.S.C. §§1311 and 1326(a), with facilities either satisfying state thermal criteria determined to ensure water quality or obtaining variances that assure the balanced indigenous populations of fish, shellfish, and wildlife. Indeed, because facilities holding §316(a) variances have performed comprehensive variance-related analyses, their effects on the water bodies into which their discharges are made are settled and established as environmentally sound. *See, e.g.,* In re: Entergy Nuclear Vermont Yankee, 89-4-06 Vtec (Decision and Order) (Vt. Envtl Ct. May 22, 2008*), aff'd* In re Entergy Nuclear Vermont Yankee Discharge Permit 3-1199, 989 A.2d 563 (Vt. 2009) (upholding agency's issuance of a thermal variance at Vermont Yankee based on a 316(a) demonstration that demonstrated assurance of balanced indigenous populations of fish, shellfish and wildlife). Thus, consideration of thermal discharges or impacts from thermal discharges are assured at all facilities nationwide in a comprehensive program separate from §316(b), and their consideration has no place in the application of §316(b). *See* Va. Elec. & Power Co. v. Costle, 566 F.2d 446, 449 (4th Cir. 1977) ("The [316(b)] regulations involved here are concerned with structures used to withdraw water for cooling purposes, not with discharges of pollutants into the water."). To that end, EPA should exclude consideration of thermal impacts from its site-specific EM controls and any other area of §316(b) implementation. If EPA persists in referencing thermal considerations, it should establish the presumption that facilities with thermal variances have no adverse impact on aquatic resources and are exempt from the final rule.

VI. MISCELLANEOUS TOPICAL COMMENTS

a. EPA's Environmental and Economic Benefits Analysis inappropriately treats CWIS as the "last straw" among various anthropogenic impacts

Without providing any causal evidence, EPA likens CWIS to "overharvesting," links CWIS to impaired waters, and suggests that CWIS impacts are masked by other anthropogenic stressors. EEBA at 2-2. Treating CWIS as the "last straw" among various anthropogenic impacts is not supported by scientific evidence and should not serve as the basis for the final rule. *See, e.g.,* AEI Report at 1, 78 (finding no evidence that impingement and entrainment contribute to any changes in the abundance of fish populations in the Hudson River). In fact, EPA acknowledges that "I&E mortality may not lead to measurable reductions in adult populations," or "may lead to indirect [positive] population effects," as a function of density dependence. EEBA. at 2-11, 3-5. The final rule should not be directed at correcting the conceded cumulative causes of "impaired" waterways (which EPA and states manage under discharge permits) and overfishing. Instead, a separate and direct regulation of the conceded causes should be undertaken.

EPA also inappropriately identifies cumulative impacts associated with clustering CWIS facilities, including clusters of CWIS facilities on the Hudson and Mississippi Rivers, including the Mississippi River near Laplace, LA. Again, the AEI Report, which represents an *in situ* analysis of population trends on the Hudson River during the long-term operation of multiple facilities, indicates otherwise. *See, e.g.,* AEI Report at 1, 78. The Louisiana Department of Environmental Quality ("LDEQ") has determined that, based on a demonstration of impacts to the river as a whole from facilities in the area, "there have been no past or current impacts associated with the withdrawal of the applicable cooling water" in the stretch of Mississippi River near Laplace, LA. LDEQ, Draft LPDES Permit #LA0007439 (June 24, 2011), Fact Sheet 16. As such, EPA's position is not supported in all instances, which EPA should acknowledge in the final rule.

b. EPA must expressly provide the requisite timelines for compliance with EM standards at nuclear facilities in its preferred Option 1

Under Option 2, EPA appropriately recognizes the need for significant flexibility in establishing timelines for compliance with §316(b) requirements. Specifically, under Option 2, most facilities would have up to ten years to complete any retrofit to closed-cycle cooling, while nuclear facilities would have up to fifteen years to do so "because all nuclear facilities are baseload generating units and the additional flexibility in timelines would further mitigate energy reliability, and because the retrofits of these types of facilities in particular involve additional complexities and safety issues." Draft Rule at 22206. EPA expressly adopts this same flexibility in its description of Option 3. *Id.*

However, EPA does not explicitly adopt this timeline flexibility in Option 1 – the preferred Option. Although EPA has not selected closed-cycle cooling as BTA under the draft Rule, it nevertheless believes that closed-cycle cooling could be required (under certain circumstances) even under Option 1. *See* draft Rule at 22210 (closed-cycle cooling "decisions would be able to be made under this proposed rule"). Accordingly, EPA should explicitly adopt the timeline flexibility articulated under Option 2 (and incorporated into Option 3) into its preferred Option 1.

c. EPA recognizes, but fails to adhere to, the fundamental distinction between a CWIS and a cooling system

Section 316(b) deals explicitly with CWIS and requires that such structures reflect the best technology available to minimize adverse environmental impacts. EPA appropriately distinguishes between *intake* technologies and cooling *system* technologies. Specifically, EPA identifies intake technologies as including coarse and fine mesh traveling screens, Ristroph traveling screens, coarse and fine mesh WWS, offshore velocity caps, and barrier nets. *See* TDD at 2-7. This is consistent with EPA's definition of "cooling water intake structure" which, consistent with §316(b), limits EPA's regulatory reach from the entrance into the intake structure to the intake pumps, and no further:

> *Cooling water intake structure* means the total physical structure and any associated constructed waterways used to withdraw cooling water from waters of the United States. The cooling water intake structure extends from the point at which water is withdrawn from the surface water source up to, and including, but not limited to, the intake pumps.

Draft Rule at 22281 (to be codified at 40 C.F.R. §125.92). In contrast, EPA recognizes that cooling system technologies include once-through and closed-cycle cooling. *See* TDD at 2-7. By definition, these are not intake technologies because the condenser cooling process occurs on the power plant side of the intake pumps—that is, beyond the intake structure. Consistent with EPA's definition of CWIS, condenser systems are beyond the scope of §316(b). *See* draft Rule at 22281 (to be codified at 40 C.F.R. §125.92).

Despite this recognized and logical distinction, EPA persists in evaluating closed-cycle cooling as a potential means of compliance with §316(b) even though it is not an intake technology. *See* TDD at 6-2, Exh. 6-1 (including closed-cycle recirculating systems, wet cooling systems, and dry cooling systems on the "List of Technologies Considered"). The type of cooling *system* employed at a power plant is dictated by the plant's ability to meet applicable thermal discharge criteria under §301 or, if it can demonstrate that its thermal discharges will maintain a balanced indigenous population in the relevant waterbody, §316(a). Thus, where a power plant satisfies §301 or §316(a) with respect to its thermal discharges, EPA cannot utilize §316(b)—which regulates only intake structures—to force a change to a facility's cooling *system*. Instead, once a power plant has demonstrated that its cooling system complies with applicable thermal discharge criteria, §316(b) can be applied to whatever intake structure corresponds to that cooling system's thermal performance. *See, e.g.,* Va. Elec. & Power Co. v. Costle, 566 F.2d 446, 449 (4th Cir. 1977) ("The [316(b)] regulations involved here are concerned with structures used to withdraw water for cooling purposes, not with discharges of pollutants into the water."). If EPA had such authority, it would render §301 and §316(a) meaningless. Thus, EPA should not consider closed-cycle cooling, or any technology that would cause reconstruction of a facility—such as the resizing of a condenser array—or operational changes to be an *intake* technology that can be required under §316(b).

d. EPA should review and rely on valid, robust laboratory studies involving cooling water intake technologies

EPA presents an analysis of the data it selected for purposes of developing standards for reduction in IM and EM, using four general criteria for including/excluding certain data from its analysis. TDD at 11-1 to 11-3. Entergy has been advised that a comprehensive critique of EPA's methods is provided by several leading analysts in *Comments on the Proposed New Rule Prepared by Consultants to the Utility Water Act Group* included as an exhibit to UWAG's comments on this draft Rule and is incorporated here by reference.

EPA's third criterion (i.e., that data must reflect technology performance that is representative of conditions that may exist under actual facility operations) appears to inadvertently "exclude[] data from tests performed under controlled laboratory conditions:"

> In contrast to the facility and field studies that generally are designed to represent normal conditions and operations, the laboratory studies generally studied how impingement and entrainment were affected by varying different components of the technology. In such studies, the laboratories sometimes operate the technologies with the intention of increasing impingement or entrainment occurrences. As a consequence, data from these studies are not representative of the performance expected at the facilities.

TDD at 11-2. EPA's implied exclusion of laboratory test data is overly broad and needlessly eliminates from consideration material, important and in certain circumstances operative information regarding the performance of certain technologies.

In particular, Entergy has undertaken extensive laboratory studies regarding the effectiveness of WWS at reducing entrainment under varying hydrodynamic conditions (e.g., through-screen velocities, sweeping flows, etc.). These studies were performed at Alden Laboratories (a co-author of the UWAG consultant comments), and provide extensive, representative and invaluable data regarding the performance of various screen sizes under a variety of conditions, notably in circumstances that can be readily monitored and verified. *See ,e.g.*, Normandeau Associates, Inc. & ASA Analysis & Communications, Inc., *2010 IPEC Wedgewire Screen Laboratory Study* (Jan. 2011) (Prepared for Indian Point Energy Center). Moreover, Entergy's technical reports build upon prior studies conducted by the Electric Power Research Institute ("EPRI"), which themselves provide relevant WWS performance data. *See, e.g.*, EPRI, *Field Evaluation of Wedgewire Screens for Protecting Early Life Stages of Fish at Cooling Water Intake Structures, Chesapeake Bay Studies*, Final Report No. 1012542 (June 2006); EPRI, *Field Evaluation of Wedgewire Screens for Protecting Early Life Stages of Fish at Cooling Water Intake Structures, Final Report*, Report No. 1010112 (May 2005); EPRI, *Laboratory Evaluation of Wedgewire Screens for Protecting Early Life Stages of Fish at Cooling Water Intakes, Final Report*, Report No. 1005339 (May 2003). We are aware of no scientific basis on which EPA would not accept such technical reports, which are included with Entergy's submission, in its analysis of WWS. This information is robust and directly relevant to EPA's draft Rule; as such, it should be considered and given significant weight. Indeed, as detailed above, these laboratory analyses advance the analysis which established that WWS performance is equivalent to closed-

cycle cooling on an annualized basis, and that WWS substantially outperform closed-cycle cooling on a cumulative basis. *See* Section II.e; Enercon Alternative Intake Technologies Report at 118. Thus, this information can only assist EPA in reaching its fundamental technology-forcing mandate in the final rule and, therefore, on a future site-specific basis.

e. Entergy's Indian Point nuclear facilities are not low capacity utilization rate units

Exhibit 5-25 of the TDD provides a list of facilities which EPA believes has a capacity utilization rate of less than ten percent (10%). As EPA is aware, the Indian Point facilities are baseload units; in recent years, capacity factors at these facilities have been in excess of ninety percent (90%). This error must be corrected and, to the extent the error has propagated through EPA's various analyses, those analyses must also be corrected. Entergy also respectfully suggests that EPA revisit the assumed capacity utilization rates for the other facilities identified in Exhibit 5-25 to identify and correct other potential errors.

Index of Documents Provided as Referenced in Comments of Entergy Corporation on EPA's Proposed Section 316(b), Rule, 76 Fed. Reg. 22174 (April 20, 2011) Docket ID No. EPA-HQ-OW-2008-0667

1. Letter from Elise Zoli, Counsel for Entergy Corp. to Proposed Rule Comment Clerk W-00-32, EPA, re: EPA ICR #2060.01 (Aug. 7, 2002)

2. Letter from Elise Zoli, Counsel for Entergy Companies to Water Docket, EPA, re: EPA Docket ID No. OW-2002-0049 (June 2, 2003)

3. Barnthouse, et al, *Entrainment and Impingement at IP2 and IP3: A Biological Assessment* (Jan. 2008)

4. **(CONFIDENTIAL BUSINESS INFORMATION, FILED UNDER SEPARATE COVER)** *Engineering Response to United States Environmental Protection Agency SWA §308 Letter, Pilgrim Nuclear Power* Station, Plymouth, Massachusetts (June 2008)

5. **(CONFIDENTIAL BUSINESS INFORMATION, FILED UNDER SEPARATE COVER)** Enercon Services Inc. et al., *Response to New York Status Department of Environmental Conservation Request for Information, James A. Fitzpatrick Nuclear Power Plant, Lycoming New York* (Jan. 2008)

6. Enercon Services, Inc., *Engineering Feasibility and Cost of Conversion of Indian Point Units 2 and 3 to Closed-Loop Condenser Cooling Water Configuration* (Feb. 12, 2010),

7. Enercon Services, Inc., *Evaluation of Alternative Intake Technologies at Indian Point Unites 2 and 3* (Feb. 12, 2010);

8. TRC Environmental Corporation, Cooling *Tower Impact Analysis for the Entergy Indian Point Energy Center, Westchester County*, New York (Sept. 1, 2009);

9. NYSDEC, CP-52/*Best Technology Available for Cooling Water Intake Structures, Nuclear Fuel Power Plants*, (July 10, 2011);

10. New Jersey Department of Environmental Protection Draft NJPDES Permit No. NJ0005550 (June 1, 2011);

11. Charles River Associates, *Indian Point Retirement Economic Analysis*, Final Report (August 2, 2011)

12. NYISO, Comprehensive Reliability Plan, Final Report (Jan. 2011);

13. Letter from David Harrison, Jr., Ph.D., Senior Vice President, National Economic Research Associates, In. ("NERA") to New York State Department of Environmental Conservation (April 29, 2010);

14. National Academies of Sciences ("NAS"), *Alternatives to the Indian Point Energy Center for Meeting New York Electric Power Needs* (2006)

15. NERA *Alternatives to the Indian Point Energy Center for Meeting New York Electric Power Needs, NERA, Electricity System Impacts of Nuclear Shutdown Alternatives* (Mar. 2002);

16. NERA *Electricity System Impacts of Certain DEC Utility Choice Alternatives* (Oct. 2001);

17. Enercon Services, Inc., *Analysis of Closed-Loop Cooling Salinity Levels, Indian Point Units 2 and 3* (Nov. 2010);

18. Tetra Tech Inc., *California's Coastal Power Plants: Alterative Cooling System Analysis* (Feb. 2008);

19. Ian Fletcher, *Flow Dynamics and Fish Recover Experiments: Water Intake Systems, TRANSACTIONS OF THE AM. FISHERIES SOC'Y*, 414-15 (May 1990);

20. LPDES Permit No. LA0007439

21. Normandeau Associates, Inc. & ASA Analysis & Communications Inc., *2010 IPEC Wedgewire Screen Laboratory Study* (Jan. 2011)

22. EPRI, *Field Evaluation of Wedgewire Screens for Protecting Early Life States of Fish at Cooling Water Intake Structures, Chesapeake Bay Studies*, Report No. 1012542 (June 2006);

23. EPRI, *Field Evaluation of Wedgewire Screens for Protecting Early Life States of Fish at Cooling Water Intake Structures, Final Report*, Report No. 1010112 (May, 2005);

24. EPRI, *Laboratory Evaluation of Wedgewire Screens for Protecting Early Life States of Fish at Cooling Water Intakes, Final Report*, Report No. 1005339 (May 2003).

Riverkeeper Meeting
December 12, 2011

Purpose of Meeting: Riverkeeper, NRDC and Sierra Club asked for a meeting to discuss their views on the 316(b) NPRM issued in April and to suggest improvements to the final rule.

Attendees: Rebecca Troutman, Riverkeeper
Steve Fleischli, NRDC
Dalal Aboulhosn, Sierra Club
Reed Super, Super Law Group

Rulemaking Schedule: The settlement agreement with Riverkeeper provides that the Administrator sign a final rule by July 27, 2012. The agreement also provides that by January 19, 2012, the "Office of Water will hold a meeting with the EPA Administrator or Deputy Administrator to discuss the range of regulatory options for EPA's final action to implement section 316(b) of the CWA for existing facilities. "

Ex. 5 - Deliberative

Cooling Water Intake Rules for Existing Facilities (316(b))

Overview

§ 316(b) of the Clean Water Act (CWA) requires the establishment of technology-based standards to minimize the environmental impact from cooling water intake structures, including ecological damage to eggs, larvae, fish and other aquatic creatures. The proposed regulations focus on ecological damage due to impingement (fish hitting and being trapped on intake screens) and entrainment (smaller fish, larvae and eggs passing through screens and drawn into the facility). Several technologies exist to address impingement, but the most effective technology for entrainment is closed cycle cooling, also called cooling towers.

To settle outstanding litigation over a previous consent decree and another case, EPA entered into a settlement agreement with Riverkeeper to promulgate a rule under §316(b). EPA published a proposed rule in April 2011, which would cover roughly 1,065 existing facilities (manufacturers or power plants) that each withdraw at least 2 million gallons per day of cooling water.

EPA issued two Notices of Data Availability (NODAs) in June 2012. NODA 1 describes impingement (fish hitting screens) flexibilities in response to comments EPA received on the proposed rule. NODA 2 describes preliminary results from a stated preference survey regarding households' willingness to pay for reductions in fish mortality. Industry comments support site-specific standards for both impingement and entrainment and oppose use of the stated preference survey; environmental groups do not support site-specific flexibilities and support the stated preference survey approach.

Current Status

The final rule is about to undergo interagency review.

Ex. 5 - Deliberative

Ex. 5 - Deliberative

General Talking Points

- EPA is currently working to develop a final rule under section 316(b) of the Clean Water Act for existing facilities, and has a settlement agreement deadline of June 27, 2013 to sign the final rule.
- EPA is carefully reviewing comments on the proposed rule and on two Notices of Data Availability as it works to finalize the rule. EPA is working to ensure that its final rule fully considers these comments and is based upon best-available scientific information.

Ex. 5 - Deliberative

CWA §316(b) Cooling Water Intake Structures Rulemaking for Existing Facilities
for Administrator's meeting with electricity CEOs
Wednesday, December 12, 2012

CWA Sec. 316(b): Any standard established pursuant to section 301 or section 306 of this Act and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

Preferred Option at proposal (April, 2011) included:

- Numeric limit for percentage impingement mortality based upon rates associated with traveling screens, with facility determining the actual technology used technology. As an alternative, facility could reduce velocity to .5 feet per second.
- Site-specific BPJ process for entrainment, with larger facilities (over 125 MGD actual flow) submitting entrainment studies.
- New units must install technology commensurate with closed cycle cooling, where "new units" was defined to include only greenfield units.
- This rule covers roughly 1,260 existing facilities that each withdraw at least 2 million gallons per day of cooling water. EPA estimates that approximately 590 facilities are manufacturers, and 670 are power plants.
- Average annual cost to households less than $1.50.

Ex. 5 - Deliberative

Ex. 5 - Deliberative

For additional information see fact sheet on EPA's 316(b) website:
http://water.epa.gov/lawsregs/lawsguidance/cwa/316b/index.cfm

316b NODA: Stated Preference Survey

May 3, 2012

316b NODA

The NODA under review at OMB since Jan 19 includes two components:

- It presents preliminary results from a new "stated preference" study quantifying the benefits from protection of fish killed at facility water intakes.
- It also responds to concerns heard in comments from industry and in letters from Governors and the Hill requesting increased flexibility on impingement standards. We have largely addressed and/or requested comments on their concerns.

Stated Preference Benefit Estimates

The stated preference survey measures nonuse benefits resulting from the 316b requirements. These benefits are very difficult to estimate through more standard economics approaches. The survey was approved by OMB and has been under development since 2004.

- The write-up of the stated preference survey currently in the NODA includes only results for the Northeast region.

Ex. 5 - Deliberative

- In the April 2011 proposal, we promised to publish the stated preference survey results in a NODA. Riverkeeper and other stakeholders are anxious to see the survey results.

Ex. 5 - Deliberative

Ex. 5 - Deliberative

In preparation for your meeting with Lew Hay of NextEra Energy on the 316b Cooling Water Intake Structure proposed rule, below is an overview and brief assessment of the issues Clean Energy Group representatives have recently raised with EPA staff (including two meetings with Sussman).

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Cooling Water Intake Structures Regulation: Status and Issues

December 12, 2011

Status

The Apr 20, 2011 Cooling Water Intake Structures (316b) NPRM comment period closed Aug 18, 2011.

- We received 900 comments on the rule.
- The settlement agreement with enviros/states requires us to finalize the rule by July 27, 2012
- The settlement also requires a discussion with the Administrator or DA, not option selection per se, by Jan 19, 2012.

Ex. 5 - Deliberative

NODA: Contingent Valuation Study

NODA includes data on the Northeast region contingent valuation (CV) study of environmental benefits from 316b.

Ex. 5 - Deliberative

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